## **VOLUNTARY CLEANUP PROGRAM APPLICATION**

#### Former Kilmer Landfill – Proposed Storage Development 6800 Kilmer Street Arvada, Jefferson County, Colorado

July 18, 2023 Terracon Project No. 25227359



Prepared for: Chelton, LLC Fort Lauderdale, Florida

#### Prepared by:

Terracon Consultants, Inc. Wheat Ridge, Colorado



July 18, 2023



Colorado Department of Public Health and Environment HMWMD-RP-B2 4300 Cherry Creek Drive South Denver, Colorado 80246-1530 Attention: Mr. Fonda Apostolopoulos

#### Re: Voluntary Cleanup Program Application Former Kilmer Landfill – Proposed Storage Development 6800 Kilmer Street Arvada, Jefferson County, Colorado 80007 Terracon No. 25227359

Dear Mr. Apostolopoulos:

Please find enclosed the Voluntary Cleanup Program (VCP) Application for your review regarding the above-referenced property, the property owner's authorization to submit the Application, and a check for the \$2,000 review fee.

Should you have any questions or require additional information, please do not hesitate to contact us at (303) 423-3300. We look forward to your comments and/or approval of this Application.

Sincerely, Terracon Consultants, Inc.

Jeffrey D. Attig Project Manager Kevin R. Saylor, PE Senior Associate

Mark White, P.G. Assistant Service Line Director

Attachments:Electronic copy on compact diskCC'd:David Schneider (Chelton, LLC)



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#### EXECUTIVE SUMMARY VOLUNTARY CLEANUP PROGRAM APPLICATION FORMER KILMER LANDFILL – PROPOSED STORAGE DEVELOPMENT 6800 KILMER STREET ARVADA, JEFFERSON COUNTY, COLORADO 80007

July 18, 2023 Terracon Project No. 25227359

On behalf of Chelton, LLC, Terracon Consultants, Inc. (Terracon) has prepared this Voluntary Cleanup Plan (VCP) Application for future development located at 6800 Kilmer Street, Arvada, Colorado (Site). This Application is being submitted in general accordance with the Voluntary Clean-up and Redevelopment Act, Title 25, Article 16, Part 3 Colorado Revised Statutes (25-16-301 et seq., CRS).

#### EXECUTIVE SUMMARY

The site consists of approximately 13.66 acres of land located at 6800 Kilmer Street in Arvada, Colorado, corresponding to Jefferson County Parcel No. 30-011-00-018. The site currently consists of vegetated vacant land that was historically the site of unpermitted landfilling activities. Ralston Creek meanders along the northern site boundary. Croke Canal runs along the westem and southern property boundaries. The proposed construction consists of surface parking for RVs, a small office building, and a 36,158-square foot stormwater detention pond in the northeastern corner of the property. A Topographic Map showing the site location is included as Exhibit 1. A site diagram showing soil boring and soil sampling locations is included as Exhibit 3. Groundwater and surface water sampling locations from Terracon's 2022-2023 additional site investigation are shown on Exhibit 4. Soil vapor sampling locations are shown on Exhibits 5 and 6. Test pit excavation locations are shown on Exhibit 7. The proposed redevelopment of the site is depicted on Exhibit 8. Note that the above-ground configuration may be revised but the proposed development plan shown is the most current iteration.

The scope of services provided by Terracon to date include the following:

- Limited Site Investigation (Terracon, July 2007);
- Geotechnical Engineering Report (Terracon, July 2007);
- Limited Site Investigation (Terracon, October 2017);
- Phase I ESA (Terracon, June 2021)
- Limited Site Investigation (Terracon, November 2021);
- Phase I ESA (Terracon, October 2022)
- Additional Site Assessment (Terracon, October 2022 to March 2023)

Prior to Terracon's involvement with the site, several assessments and investigations were conducted at the site by other consultants. The following are discussed in this Application:



- Methane Site Investigations (Jefferson County Health Department, 1980)
- Soil & Foundation Investigation (Chen & Associates, January 27, 1982)
- Cottonwood West Industrial Park Phase I Environmental Site Assessment and Preliminary Phase II Analysis [Ogden Environmental and Energy Services Company, Inc., January 1991]
- Preliminary Assessment Landfill at Cottonwood Park (Morrison Knudsen Corporation, January 1995)

Based on historical information obtained from the previous environmental assessments conducted at the site, the site consisted of open land that was disturbed in the late 1930s and utilized as an unpermitted solid waste landfill by Jefferson County from approximately 1939 until the late 1960s or early 1970s. Since 1983, the site has remained in its current configuration and condition. The site currently exists as vegetated vacant land.

Previous Phase I ESAs conducted at the site identified the following recognized environmental conditions (REC):

 Historical use of the site as a landfill and the documented impact to groundwater and soil gas at the site.

Previous subsurface assessments identified that the general lithology consists of 2 to 4 feet of shallow silty sands and silts overlying landfill materials as deep as 17 feet below ground surface (bgs). Silts, sands, and gravels were encountered below the landfill materials. Claystone was encountered at 26 to 28.5 feet below ground surface and extends to at least 35 feet bgs, which corresponds to the deepest point of investigation.

Groundwater was encountered at the site at depths ranging from approximately 6 to 18 feet bgs over the time period encompassing the various site investigations. The regional groundwater flow direction is estimated to flow to the northeast.

Contaminants of concern (COCs) have been identified during previous site investigations, likely associated with the onsite landfill material. Historical concentrations were compared to both historical and current applicable standards. COCs detected in soil, groundwater, and soil gas are summarized below:

COCs in soil include arsenic, which was reported above Environmental Protection Agency (EPA) Residential and Industrial Regional Screening Levels (RSLs) (0.68 milligrams per kilogram (mg/kg) and 3.0 mg/kg, respectively), and the Colorado background concentration of 11 mg/kg in two historical soil samples. The maximum reported arsenic concentration in soil was 26 mg/kg in soil boring B-4. Additionally, soil samples collected along Ralston Creek exceeded the Risk-Based Soil Screening Level (SSL) for barium and mercury. It is noted that COCs in



surface water samples collected from Ralston Creek were either not detected or were below potential discharge permit limits.

- COCs in the fill also include asbestos. Additional sampling was conducted by a certified Colorado Asbestos Building Inspector (CABI) during the most recent monitoring well installation to identify and analyze potential asbestos containing material (PACM). Two samples were collected (MW-1 and MW-6) and analyzed by bulk polarized light microscopy (PLM). The sample collected at MW-1 consisted of 6% chrysotile asbestos and the sample collected at MW-6 did not contain asbestos greater than 1%.
- COCs in groundwater have included benzene, toluene, and dissolved Resource Conservation and Recovery Act (RCRA) metals arsenic and selenium. Benzene was detected slightly above the human health-based Colorado Groundwater Quality Standard (CGWQS) of 5 micrograms per liter (ug/L) in one groundwater sample collected at the site during the 2007 LSI (from boring B-3); however, a groundwater sample collected during the 2021 LSI from approximately the same location did not contain a benzene groundwater concentration above laboratory reporting limits (non-detect). Toluene was detected at 1,600 ug/L at MW-10 in the December 2022 sampling, which is above CGWQS of 560 to 1,000 ug/L. MW-10 was redeveloped and sampled again in February 2023, and toluene was detected at 18 ug/L, below the CGWQS. Toluene was not detected in other monitoring wells. Arsenic and selenium were also reported above CGWQS during the 2007 LSI in soil borings B-3 and B-6 but were below CGWQS from the groundwater samples collected from the monitoring wells in December 2022.
- COCs in soil gas include a number of volatile organic compounds (VOCs) detected across the site in the soil gas samples during the 2017 LSI. The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for residential/industrial/commercial property use due to reported values above CDPHE Air Screening Concentrations and/or EPA Vapor Intrusion Screening Levels (VISLs) (EPA, 1E-06 target cancer risk, 1 target non-carcinogen hazard quotient, VISL Calculator V. 3.5.1, May 2022) : benzene, chloroform, 1,4dichlorobenzene, ethylbenzene, naphthalene, trichloroethene, and vinyl chloride. The reported concentrations of VOCs indicated the potential for soil vapors to intrude into onsite buildings at levels hazardous to human health if mitigation plans are not implemented. The VOC concentrations exceeding regulatory values were confined to SVP-01 and SVP-03 in the northwestern portion of the site, and SVP-12 and SVP-13 in the southeastern portion of the site. In addition, carbon tetrachloride, dichlorodifluoromethane, and tetrachloroethene concentrations represented a vapor intrusion concern for residential but not commercial/industrial use.

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Methane was evaluated against its Lower Explosive Limit (LEL), which is 50,000 parts per million by volume (ppmv). Laboratory methane detections ranged from 1,790 ppmv to 10,900 ppmv. Methane concentrations exceeded 10% of the LEL or 5,000 ppmv for methane at SVP-01, SVP-03, SVP-05, and SVP-07. The laboratory analysis of methane indicates a potential ignition risk for future structures at the site. Nine additional soil vapor points installed along the eastern and southern site perimeters were sampled and analyzed for methane in October 2022, with no reported detections above 10% of the LEL.

The following exposure pathways are considered to be complete or potentially could be completed during construction (refer to Tables 1-3 and 5 for a comparison of soil, groundwater, and soil gas concentrations to exposure-specific screening levels for industrial/composite worker exposure scenarios):

- Industrial Soil Dermal Contact (Soil I-Derm);
- Industrial Soil Ingestion (Soil I-Ing); and,
- Vapor Intrusion (Soil Gas vi)

The proposed Remedial Action Plan (RAP) for the site considers no new changes to the current planned development of the site and includes specific remedial tasks that will be implemented to mitigate and reduce short-term and long-term exposures to site contaminants. The conceptual RAP selected for this site is summarized below.

Excavation activities during redevelopment will be conducted to facilitate construction of the surface storage parking areas, underground utilities, the stormwater detention basin, the storage office building, and light pedestals. Based on Terracon's 2007, 2017, and 2022 LSI results and professional experience, it is expected that metals, VOCs, semi-volatile organic compounds (SVOCs), and asbestos may be encountered based on historical knowledge of the impacted landfill material and soils. It's anticipated that landfill material excavated and generated to facilitate development will be sampled, characterized and disposed of as a special waste at a Subtitle D Landfill per the Materials Management Plan (MMP) based on a waste characterization profile created from analytical data for the site.

In the event that Regulated Asbestos-Containing Soil (RACS), as defined in the CDPHE 6 CCR 1007-2 Part 1 – Regulations Pertaining To Solid Waste Sites and Facilities, Section 1.2 Definitions, effective June 30, 2018, are encountered during redevelopment activities, it shall be managed in accordance with the MMP and in compliance with the CDPHE 6 CCR 1007-2 Part 1 – Regulations Pertaining To Solid Waste Sites and Facilities and Section 5.5 (Management of RACS), effective September 30, 2014.

Regarding the vapor intrusion pathway, detected VOCs and methane in soil gas indicate a potential vapor intrusion and ignition risk for future structures at the site. The proposed construction includes one slab-on-grade office building. The proposed RAP includes the



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installation of an active vapor mitigation system (VMS) beneath the building slab to mitigate vapor intrusion into the building. The VMS will contain LEL and pressure sensors and be tied to a fire control panel in the event that vapors exceed 5 and 10 percent of the LEL trigger levels. The installation of the vapor mitigation system will be observed and tested under the supervision of a professional engineer licensed in Colorado to document that the membrane and other system infrastructure has been installed per the manufacturer's and design specifications.

Additionally, the RAP proposes establishing a Notice of Environmental Use Restriction to restrict soil disturbance activities, prohibit the use of onsite groundwater, and require active VMSs be installed beneath site building(s) constructed over areas with vapor intrusion concerns.

#### VOLUNTARY CLEANUP PROGRAM APPLICATION FORMER KILMER LANDFILL – PROPOSED STORAGE DEVELOPMENT 6800 KILMER STREET ARVADA, JEFFERSON COUNTY, COLORADO 80007

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#### **1.0 GENERAL INFORMATION**

On behalf of Chelton LLC, Terracon Consultants, Inc. (Terracon) has prepared this Voluntary Cleanup Plan (VCP) Application for the future development located at 6800 Kilmer Street, Arvada, Colorado (site). This Application is being submitted in general accordance with the Voluntary Clean-up and Redevelopment Act, Title 25, Article 16, Part 3 Colorado Revised Statutes (25-16-301 et seq., CRS). Implementation of the procedures outlined in this document is intended to aid in the protection of public health and the environment during redevelopment activities and following construction completion.

ITEM	DESCRIPTION			
Site Address	6800 Kilmer Street Arvada, Jefferson County, Colorado			
Site Area	Approximately 13.66 acres			
Parcel Number(s)	30-011-00-018			
Current Land Use	Vegetated vacant land			
Current Zoning	Light Industrial – 40 feet maximum height (IL), per the Arvada Municipal Code, Version November 17, 2021.			
Current Ground Cover	Vegetation, soils, gravel			
Topography	Very gently sloping towards the northeast			
Proposed Construction	The developer plans to redevelop the property to include surface parking/outdoor storage (recreational vehicles), a stormwater detention basin, and an office building			
	Chelton, LLC			
Property Owner	PO Box 460010 Fort Lauderdale, Florida 33346			
Prepared For	Colorado Department of Public Health and Environment (CDPHE) HMWMD-RP-B2 Attn: Mr. Fonda Apostolopoulos 4300 Cherry Creek Drive South Denver, Colorado 80246-1530 (303) 692-3411			



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ITEM	DESCRIPTION
Contact Person	Terracon Consultants, Inc. (Terracon) Jeffrey D. Attig 10625 West I-70 Frontage Road North, Suite 3 Wheat Ridge, Colorado 80033 (303) 454-5215

A Topographic Map showing the site location is included as Exhibit 1, a site diagram showing soil boring and soil sampling locations is included as Exhibit 2. A site diagram showing historical groundwater sampling locations is included as Exhibit 3. Groundwater and surface water sampling from Terracon's 2022-2023 additional site investigation are shown on Exhibit 4. Soil vapor sampling locations shown on Exhibits 5 and 6. Test pit excavation locations are shown on Exhibit 7. The proposed redevelopment of the site is depicted on Exhibit 8. Note that the above-ground configuration may be revised but the proposed development shown is the most current iteration.

Terracon services conducted to date on this property were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of other consultants laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. This document was prepared in accordance with the scope of work agreed to by Chelton, LLC, as reflected in our proposal (P25227359).

Any approaches, plans, findings, conclusions, and recommendations presented in this document are based upon information derived from assessment and survey activities conducted by Terracon and other environmental consultants. Such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during previous assessments conducted for the site by Terracon or others. The data, interpretations, approaches, plans, findings, and any recommendations are based solely upon data obtained at the time and within the scope of those services.

#### 2.0 PROGRAM INCLUSION

For VCP eligibility, the following criteria must be met for the above-mentioned property. An answer of "No" to Question 1 or "Yes" to any of Questions 2 through 6 would disqualify this property from the program.

CRITERIA	YES / NO
Is the applicant the owner or the owner's designated representative of the property?	Yes

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CRITERIA	YES / NO
Is the property listed or proposed for listing on the National Priorities List of Superfund Sites established under the Federal Act (CERCLA)?	No
Is the property the subject of corrective action under orders or agreement issued pursuant to provisions of Part 3 of Article 15 of this Title or the federal RCRA of 1976, as amended?	No
Is the property subject to an order issued by or an agreement (including permits) with the Water Quality Control Division pursuant to Part 6 of Article 8 of this Title?	No
Is the property a facility that has or should have a permit or interim status pursuant to Part 3 of Article 15 of this Title (RCRA Subtitle C) for treatment, storage, or disposal of hazardous waste?	No
Is the property subject to the provisions of Colorado Revised Statutes, Part 5 of Article 20 of Title 8 (Underground Storage Tanks)?	No

Based on the above criteria being met, the site is eligible for the VCP.

#### 3.0 HISTORICAL INVESTIGATIONS

The following site investigations have been completed for the site. The findings from these investigations are summarized in this Application.

TERRACON REPORTS	DATE	ATTACHMENT
Limited Site Investigation, Terracon	07/24/2007	Appendix A
Geotechnical Engineering Report, Terracon	07/24/2007	Appendix B
Limited Site Investigation, Terracon	10/09/2017	Appendix C
Phase I ESA, Terracon	06/18/2021	Appendix D
Limited Site Investigation, Terracon	12/03/2021	Appendix E
Phase I ESA, Terracon	10/13/2022	Appendix F
HISTORICAL REPORTS BY OTHERS	DATE	ATTACHMENT
Methane Site Investigations, Jefferson County Health Department	1980	
Soil & Foundation Investigation, Chen & Associates	01/27/1982	
Cottonwood West Industrial Park Phase I Environmental Site Assessment and Preliminary Phase II Analysis, Ogden Environmental and Energy Services Company, Inc	01/17/1991	Appendix H
Preliminary Assessment – Landfill at Cottonwood Park, Morrison Knudsen Corporation	01/24/1995	



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Historical investigations conducted at the site included Phase I ESAs and soil, groundwater, and soil gas sampling performed to identify contaminants of concern (COCs) related to on-site sources related to Recognized Environmental Conditions (RECs) identified in the Phase I ESAs. Data from the historical investigations were compared to the present-day conditions and data with an emphasis being placed on the evaluation of recent data as aged, historical data may now be inaccurate and not accurately represent current site conditions. A brief description of observed soil, groundwater and soil conditions from the historical investigations follows.

#### 4.1 Qualifications of Professionals

Qualified professionals were involved in the preparation of the Terracon Phase I ESA, Terracon Limited Site Investigations, Terracon Geotechnical Engineering Report, and this VCP Application.

#### 4.2 Historical Reports by Others

#### Methane Site Investigations [Jefferson County Health Department (JCHD), 1980]

According to the 1980 report, JCHD conducted methane studies on a number of landfills in the county. The Kilmer site appears to have been identified with landfills to the south of the site across Croke Canal as 64<sup>th</sup> Avenue West of Indiana Street. According to the report, Jefferson County operated a domestic and commercial refuse landfill between 1939 and 1942. Much of the fill was reportedly burned. While methane sampling was conducted at the landfills south of Croke Canal, methane was not sampled at the Kilmer site. Due to the lack of sampling at the Kilmer site, it is unclear if the historical summary applied to the Kilmer site or just to the landfills south of Croke Canal. Evidence of burned waste has not been observed during Terracon's subsurface investigations. The report is included in Appendix H.

#### Soil & Foundation Investigation [Chen & Associates (Chen), January 1982]

The Chen & Associates (Chen) investigation was conducted to facilitate construction of a bridge across Ralston Creek in the Cottonwood Subdivision. As part of the investigation, several borings were drilled at the site to evaluate the presence of landfilled material. The details of the report are conflicting, which noted landfill material depths of both 8 to 16 feet as well as 20 to 25 feet of trash fill, consisting of metal, plastic, wood, paper, glass, and organic material. Approximately 3 feet of sandy clay was noted above the fill. Groundwater was encountered from 10.5 to 14 feet below ground surface (bgs). Methane readings ranged from 85% to 100% of the LEL. The report is included in Appendix H.





Ogden prepared a Phase I ESA for several parcels of land, including the site. The ESA included a review of a 1970 aerial photograph that indicated the presence of a landfill excavation and the placement of a soil cap. The Phase I ESA included a summary of the Chen report discussed above. Interviews indicated that Jefferson County had operated the on-site landfill as early as the early 1950s until the early 1970s. The ESA report also identified landfills south of the site across Coke Creek. Trash, suspected petroleum hydrocarbon impacts, algal growths, and probable landfill leachate were noted in Ralston Creek at the time of site reconnaissance. Refuse was exposed in some areas at the site as well.

In addition to standard ESA scope items, Ogden also conducted a magnetic survey, a radiological survey, and limited sampling. The findings of the magnetic survey indicated landfilled material across the site, with some high magnetic response areas. The radiological survey did not indicate gamma radiation above background.

The report has conflicting information regarding soil and water samples collected and analyzed. However, according to the laboratory report, one soil sample was analyzed for VOCs (collected from a stained area) and one soil sample was analyzed for polychlorinated biphenyls (PCBs) and lead (collected as a composite sample from an embankment area that was eroded). One groundwater sample (collected via a drive well tube) was analyzed for VOCs and total lead.

A number of VOCs were detected in the soil sample collected from the stained area in the part per billion range. A cursory review of the results did not indicate concentrations exceeding Residential Screening Levels (RSLs). PCBs were not detected above the reporting limits, and lead was detected at a concentration of 56 mg/kg, which is below the residential RSL of 400 mg/kg in the composite soil sample. VOCs were not detected above the reporting limits in the groundwater sample. Total lead was reported at 65 micrograms per liter (ug/L). Comparison of total lead to the CGWQS is not applicable. The report is included in Appendix H.

## Preliminary Assessment – Landfill at Cottonwood Park [Morrison Knudsen Corporation (MK), January 1995]

The assessment report was prepared by MK for the EPA. The assessment was conducted at the site under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA). At the time, the site had been assigned CERCLA Information System Number CO0000309054. The assessment included a review of available files, site reconnaissance, and a migration pathway evaluation. The report included a summary of the Chen and Ogden reports discussed above. The assessment did not include an opinion as to whether or not the site should be included on the National Priorities List (i.e., a Superfund site). According to the EPA's website, the site is identified

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as No Further Remedial Action Planned (NFRAP), as the "Site does not qualify for the NPL based on existing information" (<u>https://cumulis.epa.gov/supercpad/CurSites/csitinfo.cfm?id=0801445</u>). The Preliminary Assessment and NFRAP finding are included in Appendix H.

#### 4.3 Limited Site Investigation – Terracon

A Limited Site Investigation (LSI) report was prepared by Terracon for VCGY-10, LLC, report dated July 24, 2007. The LSI was conducted to evaluate the potential for environmental impact of the site from historical onsite unpermitted landfill operations. Ten borings were advanced onsite as part of a geotechnical investigation, and four borings (3, 4, 6, and 9) were screened and had soils sampled as part of the LSI. The general soil lithology encountered during sample collection consisted of municipal landfill refuse (household trash such as lawn cuttings, clothing, plastic containers, and carpet) and was observed to depths ranging from 7.5 feet (Boring 10) to 16 feet bgs (Borings 8 and 9). Native soils underlying the refuse consisted of interbedded sand, gravel, cobbles, clay, and claystone bedrock and were observed to a depth of 35 feet bgs.

One composite soil sample was collected from each of the four LSI borings and analyzed for Resource Conservation and Recovery Act (RCRA) metals and bulk asbestos. In addition, a fourboring composite soil sample was submitted for Toxicity characteristic leaching procedure (TCLP) RCRA metals, TCLP volatile organic compounds, TCLP semi-volatile organic, Pesticides and polychlorinated biphenyls, and Herbicides. Terracon reported asbestos was not detected in the soil samples collected from the site. Several RCRA metals were detected above laboratory reporting limits; however, the detections did not exceed the current RSLs with the exception of arsenic, which exceeded the present-day Industrial RSL and Colorado average background concentrations. TCLP concentrations did not exceed Colorado hazardous waste standards. The reported arsenic concentrations in soil are summarized below:

- 15 mg/kg in soil boring B-3 and 26 mg/kg in soil boring B-4, above the Colorado background concentration of 11 mg/kg;
- 4.6 mg/kg in soil boring B-6, above the Industrial RSL of 3.0 mg/kg; and,
- 1.2 mg/kg in soil boring B-9, above the Residential RSL of 0.68 mg/kg.

Ten groundwater samples were collected from the site, one from each boring, and were analyzed for VOCs and dissolved RCRA metals. Groundwater was measured at depths of approximately 6 to 14 feet bgs. The following COCs were detected at concentrations above historical regulatory limits and the present-day CGWQS:

- Benzene in boring B3 at 6.8 μg/L, above the 5.0 μg/L CGWQS ;
- Arsenic in boring B6 at 26 μg/L, above the 10 μg/L CGWQS; and,
- Selenium in borings B3 and B6 at 68 and 67 μg/L, respectively, above the 50 μg/L CGWQS.

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#### 4.4 Preliminary Geotechnical Engineering Report - Terracon

A Preliminary Geotechnical Engineering Report was prepared by Terracon VCGY-10, LLC, dated July 18, 2007. The Geotechnical Report was conducted for a proposed multi-story residential development at the site. A total of 10 exploratory borings were drilled. Based on the results of the borings, subsurface conditions encountered on the project site consisted of approximately 2 to 4 feet of sandy clay and clayey sand fill cover, underlain by landfill debris mixed with sandy clay and clayey sand. Native sand and clay soils, with varying amounts of silt and gravel were encountered directly beneath the landfill materials and extend to depths of about 15 to 24 feet below existing site grade. A poorly-graded to well-graded sand and gravel layer, of variable thickness, underlies the sand and clay deposits. Bedrock consisting of claystone, with varying amounts of sandstone, was encountered below the sand and gravel layer and extends from depths of about 26 to 28½ feet below existing grade down to the full depth of exploration

The soil boring was observed for the presence and depth of groundwater. During drilling, groundwater was encountered at depths ranging from about 8 to 17 feet below existing site grade in a majority of the borings at the time of field exploration. When checked a minimum of 1 day after drilling, groundwater was measured at depths from about 6 to 14 feet below existing site grade.

#### 4.5 Limited Site Investigation – Terracon

An LSI Report was prepared by Terracon for Chelton, LLC, report dated October 9, 2017. Fourteen soil gas points (SVP-01 through SVP-14) were installed at the site. Soil gas points were installed in borings that were advanced with a solid-stem auger drill rig. The soil gas points, consisting of eight-inch long stainless-steel screened points and Teflon tubing, were placed into each boring at an approximate depth of 5 feet bgs and backfilled with silica sand to approximately 6 inches above the top of the screen, followed by hydrated bentonite to near surface.

Borings typically encountered sand, landfill debris (e.g., wood, glass, wire, paper, plastic), and odors consistent with trash/household waste. Field screening indicated VOCs up to 18 parts per million (ppm) isobutylene equivalents (SVP-13) and methane concentrations up to 7% of the LEL (SVP-01). Measurements taken during purging indicated VOCs up to 4 ppm (several locations) and methane concentrations up to 99% of the LEL (SVP-01, SVP-03, and SVP-13).

One soil gas sample was collected from each soil gas point and analyzed for VOCs. A number of VOCs were detected across the site. The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for residential/industrial/commercial property use: benzene, chloroform, 1,4-dichlorobenzene, ethylbenzene, naphthalene, trichloroethylene, and vinyl chloride. The reported concentrations of VOCs indicated the potential for soil vapors to intrude into onsite buildings at levels hazardous to human health if mitigation plans are not implemented. The VOC concentrations exceeding regulatory values were confined





to SVP-01 and SVP-03 in the northwestern portion of the site, and SVP-12 and SVP-13 in the southeastern portion of the site.

The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for only residential property use and not industrial/commercial property use: carbon tetrachloride, dichlorodifluoromethane, and tetrachloroethylene.

Methane was evaluated against its Lower Explosive Limit (LEL), which is 50,000 parts per million by volume (ppmv). Laboratory methane detections ranged from 1,790 ppmv to 10,900 ppmv. Methane concentrations at SVP-01, SVP-03, SVP-05, and SVP-07 exceeded 10% of the LEL or 5,000 ppmv for methane. The laboratory analysis of methane indicated a potential ignition risk for future structures at the site.

Soil gas analytical data is included in Table 5, respectively. Soil gas sampling locations are depicted on Exhibits 5 and 6.

#### 4.6 Phase I Environmental Site Assessment – Terracon

A Phase I ESA was prepared for the site by Terracon for Carlson Associates, Inc., report dated June 18, 2021, in general accordance with ASTM E1527-13, to review historical records, document past land uses on the site and adjoining properties, and identify possible environmental concerns regarding the site.

The site appears to have been primarily undeveloped land, with Ralston Creek meandering along the northern site boundary as early as 1937. Portions of the site appear to have been disturbed in 1937. From 1963 to 1978, operations at the south and later east adjoining properties appear to have encroached onto the southeast portion of the site. In 1983, the site appears to have a trail across the northern portion of the site, similar to its current day configuration.

A Jefferson County Methane Gas Site (JCMETHANE) listing as well as a Historical Solid Waste Landfill (HISTSWLF) listing is mapped within the boundaries of the site. The HISTSWLF was reportedly operational between 1939 to 1942 and operated by Jefferson County. (Information obtained after the issuance of the Phase I ESA indicates the landfill was operated until the late 1960s or early 1970s.) Fill was reported at a depth approximately 20 feet bgs. Methane was also documented at the site by the Jefferson County Health Department.

Terracon identified the following controlled REC (CREC) in connection with the site:

Historical use of the site as a landfill and the documented impact to groundwater and soil gas at the site.

Terracon recommended the following:



- Consultation with the CDPHE regarding potential regulatory involvement driven by the historical landfill and documented impacts. Additional investigation and or mitigation/remediation measures may be required by CDPHE.
- Incorporation of an appropriately-designed vapor mitigation system (VMS) for any future buildings at the site.
- Conduct soil gas sampling along the perimeter of the site boundary in areas where neighboring buildings adjoin the site, and potentially in other areas.
- Use of a Materials Management Plan to facilitate management of environmentally impacted media during redevelopment activities.

#### 4.7 Limited Site Investigation Report – Terracon

A LSI report was prepared by Terracon for Carlson Associates, Inc., dated December 3, 2021. The LSI was conducted to evaluate the documented historical on-site benzene impacts to groundwater and the depth and extents of landfill materials in the vicinity of proposed buildings and stormwater detention basin. A total of 5 exploratory borings (SB-11 through SB-15) were advanced to approximate depths of 15 to 19 feet bgs. Soil boring SB-11 was converted to a groundwater monitoring well. No soil samples were collected for laboratory analysis, and one groundwater sample was collected from the monitoring well installed at SB-11.

Groundwater analytical results were compared to the December 2020, CGWQS. Groundwater analytical data is included in Table 2. Soil boring locations and groundwater sampling locations are depicted on Exhibit 2 and Exhibit 3, respectively.

#### Soil Investigation Summary

- In general, the lithology encountered during drilling consisted of shallow silty sands and silts overlying 1.5 to 8.5 feet of landfill material except for SB-15, where landfill material was not observed. Silts and sands with some gravel were encountered below the landfill material to the terminal depths of 15 to 19 feet bgs.
- Field screening measured VOCs above the field detection limit of 1 ppm isobutylene equivalent in the screened soils from soil borings SB-11 through SB-15. VOCs were detected at a maximum concentration of 497 ppm isobutylene equivalents from SB-13 within the 2.5 to 5-foot bgs interval. Black discoloration was observed below the landfill material in soil borings SB-11 through SB-13.

#### **Groundwater Investigation Summary**

Groundwater was encountered at approximately 9 to 10 feet bgs during drilling.

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- Soil boring SB-11 was completed as a groundwater monitoring well to collect a groundwater sample to be analyzed for VOCs (benzene only).
- Laboratory analysis of the groundwater sample did not detect the presence of the COCs that were above the benzene CGWQS of 5 ug/L.

#### 4.8 Phase I Environmental Site Assessment – Terracon

A Phase I ESA was prepared for the site by Terracon for Chelton LLC, report dated October 13, 2022, in general accordance with ASTM E1527-13. Findings were generally consistent with the June 2021 Phase I ESA. The site at 6800 Kilmer Street was identified in the environmental regulatory database report as Kilmer Landfill – Storage Development, a voluntary cleanup and redevelopment property. This listing was based on the VCP Application prepared for the site by Terracon for Carlson Associates, Inc., report dated January 20, 2022, received by the state regulatory agency on January 25, 2022. The VCP database report listing identified impacted media at the site as soil contaminated with arsenic and groundwater impacted by BTEX. The historical use of the site as a landfill and the documented impact to groundwater and soil gas at the site were considered RECs.

Terracon recommended the following:

Continued consultation with the CDPHE in preparing a revised VCP application, including additional investigation requested by the EPA and development of a materials management plan, RAP, and potential use of engineered barriers and/or institutional controls.

#### 4.9 Additional Site Assessment – Terracon 2022-2023

The primary objective of the additional environmental services was the collection of site investigation data to include in this VCP Application. The conducted site investigation services were designed to assess for the presence of chemicals commonly associated with the on-site REC (known unpermitted landfill) at concentrations above applicable regulatory standards in soil, soil vapor, groundwater, and surface water, as well as for the presence of wetlands. The scope of work for this additional assessment was developed after consultation with CDPHE. A summary of the activities performed is outlined below. Laboratory reports for the Additional Site Assessment are included in Appendix I.

#### 4.9.1 Desktop Wetlands Survey

To establish baseline conditions of the Project Site, a Terracon wetland biologist gathered preliminary information from the U.S. Fish and Wildlife, National Wetland Inventory (NWI) database; U.S. Geological Survey topographic maps; aerial imagery; and ground photographs. The desktop results were then ground-truthed by conducting a field reconnaissance to identify

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potential wetlands, point-locate them with a handheld GPS unit, document them photographically, and identify in the field with survey flagging. Terracon then compiled a Technical Memorandum dated October 7, 2022, that summarized regulatory framework, methodology, limitations and findings, and site-specific conclusions and recommendations (Appendix G).

The desktop review did not identify wetlands on the project site; however, Ralston Creek and the Croke Canal are both just outside the project boundary. Construction activities within the regulatory floodway will require consultation with and approval from FEMA, which would impact the project schedule and budget. To avoid these impacts, Terracon recommended that the floodway be fenced off before construction and marked as a no parking, no staging, no work area. There are no additional concerns related to the wetlands.

#### 4.9.2 Soil Vapor Sampling

Following CDPHE comments and client input, Terracon conducted the installation of eight soil gas points (SVP-15 through SVP-22) on October 10, 2022, to evaluate if methane is present within the onsite soil gas along the southern and eastern site boundaries. The sample points consisted of six-inch long stainless-steel screened point and Teflon tubing installed to an approximate depth of 5 feet below ground surface (bgs) and backfilled with silica sand to approximately 6 inches above the top of the screen, followed by hydrated bentonite to near surface. The locations of the soil gas points are provided on Exhibit 6.

On October 11, 2022, at least 24 hours following installation, soil gas samples were collected for laboratory analysis. Soil gas sampling was conducted within a polyethylene shroud placed over the sampling point. Leak detection was conducted by introducing helium tracer gas into the sampling shroud through a separate port prior to sampling and using a portable helium gas detector to monitor for potential leaks in the sampling train. A peristaltic pump was utilized to purge the sample train tubing prior to collecting the laboratory sample within a 1-liter summa canister.

After purging the sampling point of approximately three sampling train volumes and observing that helium concentrations detected through the sampling train are within acceptable levels (i.e., less than [<]5 percent [%] of the helium concentration in the shroud), a laboratory-supplied 1-liter summa canister was filled with soil gas for analysis. The sample was collected using dedicated nylon sample tubing equipped with a laboratory-supplied flow regulator allowing for sample collection at a low-flow rate (i.e., 200 ml/min).

Upon completion of sample collection, the Summa canister valve was closed, secured, and appropriately labeled with pertinent sample information. Canister pressure was recorded prior to and after sample collection. The sample canisters were placed into a shipping container and transported under chain-of-custody to the contract laboratory for analysis.

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The samples were sent to Pace analytical in Mt Juliet, Tennessee to be analyzed for fixed gasses (methane) by method 8015M. SVP-19 was not analyzed due to shallow water interfering with the soil gas sampling system, which would compromise quality of the sample. Samples SVP-15 through SVP-18 and SVP-20 through SVP-22 did not have results above the laboratory detection limit, which was less than 10% of the LEL. See Table 5 for a summary of recent and historical soil gas assessments at the Site.

#### 4.9.3 Ralston Creek Surface Water and Embankment Surface Soil Sampling

#### Surface Water Sampling

Terracon personnel mobilized to the site on October 10, 2022, to collect three surface water samples (SW-01 through SW-03) from Ralston Creek. One surface water sample was collected upstream of the site, a second surface water sample was collected at the approximate site's midpoint, and a third surface water sample was collected downstream of the site. Samples were shipped to Pace Analytical in Mt. Juliet, Tennessee to be analyzed for RCRA Metals (dissolved basis) by method 6010B/7470A, volatile organic compounds (VOCs) by 8260B, and polynuclear aromatic hydrocarbons (PAHs) by 8270C as requested by the CDPHE. Samples were compared to CDPHE Water Quality Control Division (WQCD) Regulation No. 38 (5CCR 1002-38), Classification 7 Numeric Standards for South Platte River Basin, Laramie Basin, Republic Rover Basin, Smoke Hill, CDPHE WQCD Regulation No. 31 (5CCR 1002-31), The Basic Standards & Methodologies for Surface Water, and CDPHE WQCD Regulation No. 41 (5CCR 1002-41), The Basic Standards for Ground Water.

No analytes were detected above laboratory detection limits except for barium in SW-01, SW-02, and SW-03. However, these detections were substantially below applicable regulatory standards. A summary of surface water analytical results can be found in Table 4.

#### Embankment Surface Soil Samples

In addition to surface water samples, four surface soil samples (SS-01 through SS-04) were collected from the stream embankment just above the mean high-water level along Ralston Creek. One soil sample was collected near the western site boundary, one was collected from the central area of the site, and one was collected near the eastern site boundary. A fourth sample, was collected across Ralston Creek and upgradient from the site to establish background stream embankment soil conditions.

The four surface soil samples were shipped to Pace Analytical in Mt. Juliet, Tennessee to be analyzed for RCRA Metals by method 6020B/7471, VOCs by method 8260B, and PAHs by method 8270C-SIM as requested by the CDPHE. The reported analytical results were compared to Residential, Industrial, and Risk-Based USEPA Soil Screening Levels (SSL). Arsenic, barium, cadmium, chromium, lead, and mercury were detected above applicable method detection limits in all samples. However, only arsenic, cadmium, and mercury exceeded applicable regulatory standards.

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Arsenic concentrations ranged from 8.93 mg/kg (SS-02) to 4.23 mg/kg (SS-01), which exceeded Residential, Industrial, and Risked-Based SSLs. However, these concentrations were below the CDPHE background value for arsenic of 11 mg/kg, or collected upgradient of the site, indicating the reported arsenic concentrations are likely naturally occurring.

Cadmium and mercury exceeded their respective Risked-Based SSLs. However, review of the reported data indicates that the upgradient, background sample concentrations from SS-01 were of the same order of magnitude of those collected from SS-02 through SS-04, which indicates the reported cadmium and mercury concentrations are likely naturally occurring or anthropogenic in nature.

Benzo(b)fluoranthene was detected in SS-01, and fluoranthene and pyrene were detected in SS-01 and SS-04. These PAH detections were reported below all applicable US EPA Residential and Industrial RSLs and SSLs. As noted above, only barium was detected in the Ralston Creek surface water samples. A summary of surface soil analytical results can be found in Table 1.

Standard chain-of-custody procedures were used. Samples were handled and processed at all times by personnel wearing disposable nitrile gloves. Sampling equipment was cleaned prior to project commencement and before beginning each sampling location. Non-dedicated sampling equipment was cleaned using an Alconox® detergent wash and potable water rinse prior to commencement of the project and between the collection of each sample. Additionally, each sample location was marked using a handheld, global positioning system (GPS) instrument.

#### 4.9.4 Landfill Evaluation Geophysical Survey

Based on the client's request, Terracon conducted geophysical survey of the site on October 25, 2022. The purpose of this geophysical survey was to evaluate the likely extents and depths of onsite landfill waste.

Terracon utilized a ground penetrating radar (GPR) system consisting of a 200/600 MHz Hi-Mod antenna along with a Multi-Channel Ground Penetrating Radar (MCGPR) and Frequency Domain Electromagnetic Induction (FDEMI) to explore the site. The areas surveyed focused on planned construction locations outlined in a previous version of the site development plans. The depth of exploration was estimated to be between 6 to 10 feet below the existing grade level. Actual depth of the exploration was dependent on soil conditions and other site features. The geophysical survey was performed in areas accessible to the equipment being used.

MCGPR data was post-processed using the GRED software suite by IDS GeoRadar. MCGPR post-processing consists of position correction and background removal (filtering). The MCGPR data can then be evaluated in orthogonal and cross-section views for analysis.

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GPR utilizes radio waves to detect changes in the subsurface of the area being scanned. Changes in the signal generally indicate material property changes such as, but not limited to, electromagnetic conductivity and dielectric constant, which in some cases can be qualitatively linked to other material properties such as density, moisture, or material type, and can be effective in identifying the presence and location of items such as voids, rubble, buried concrete, tanks, underground utilities, and embedded reinforcing steel in concrete and masonry structures, among other things.

Analysis of the processed GPR survey data indicated the likely presence of buried waste/landfill material over a large majority of the site, including areas planned for development, consistent with historical soil boring observations. The eastern and southern site boundaries appeared to have the lowest likelihood of significant landfill debris. The most significant anomalies were observed in the southeast and northwest portions of the site. Based on this information, CDPHE requested further subsurface investigation in these areas to evaluate the type and quantities of landfill debris present. The test pit investigation is outlined in Section 4.9.6.

It should be noted that these processes rely on instrument signals to indicate physical conditions in the field. Signal information can be affected by on-site conditions beyond the control of the operator such as, but not limited to, soil types, soil moisture, reinforcing steel spacing, and/or groundwater table depth. Interpretation of those signals is based on a combination of known factors combined with the experience of the operator and geophysical scientist evaluating the results. The geophysical results provide a level of confidence but should not be considered absolute.

#### 4.9.5 Groundwater Monitoring Well Installation and Sampling

On November 28 through 30, 2022 a total of ten soil borings (MW-01 through MW-10) were advanced utilizing a hollow-stem auger drill rig equipped with a continuous soil sampler for the installation of monitoring wells and collection of groundwater samples for laboratory analysis. A qualified well driller (Site Services, Inc.) with field oversight from a Terracon environmental field professional performed these drilling services. Refer to the attached Exhibit 4 for the soil boring locations. The soil boring locations were selected after review of the historical documentation and known site conditions and input from CDPHE.

Soil samples were collected during drilling to document lithology, color, and for laboratory analysis if deemed necessary. Soil samples were field screened using sensory methods and with a photoionization detector (PID) equipped with a 10.6 electron volt ultraviolet lamp source to evaluate for the presence of potential volatile organic compound vapors. A six-gas meter was also used to detect the presence of any methane gas in the breathing space during advancement of the soil borings. Terracon personnel did not encounter unanticipated conditions that warranted laboratory analysis during soil boring advancement (i.e., field observations of significantly elevated PID readings, six-gas readings, soil staining, buried drums, etc.).



Additional sampling was conducted by a certified Colorado Asbestos Building Inspector (CABI) to identify and analyze potential asbestos containing material (PACM). Collected samples were delivered to Eurofins Reservoirs in Denver, Colorado to be analyzed on same day turnaround. A total of two sample locations were collected (MW-1 and MW-6) and analyzed by bulk polarized light microscopy (PLM). The sample collected at MW-1 contained 6% chrysotile asbestos and the sample collected at MW-6 was not reported to contain asbestos.

The monitoring well locations were advanced at least 5 feet into the observed water table and completed with 10 feet of 0.010-inch factory slotted well screen in sand pack, and blank well casing in partially hydrated bentonite to the surface. The monitoring wells were finished with a 6-inch diameter traffic rated flush mount well cover and cemented in place at existing grade.

On December 1, 2022, approximately 24 hours after installation, each well with observed groundwater was developed with a high-volume purge pump to clear sediment from the well and sand pack and establish connectivity with the groundwater formation. A minimum of 10 well volumes were purged from each well, and groundwater parameters were monitored for stabilization.

On December 2, 2022, approximately 24 hours after development, one groundwater sample was collected from each of the installed monitoring wells and a historic well (SB-11). Prior to collecting groundwater samples, Terracon purged the groundwater monitoring wells utilizing low-flow sampling techniques, and periodically monitored temperature, specific conductivity, dissolved oxygen (DO), pH, and oxidation reduction potential (ORP) with a flow-through cell and a YSI 556 Meter. Once the above-referenced parameters stabilize to a variance of 10% or less (pH varying less than 0.2 pH units) within three consecutive measurements, a groundwater sample was collected.

Samples were submitted to Eurofins TestAmerica in Arvada, Colorado for laboratory analysis following standard chain-of-custody procedures. Samples were analyzed for dissolved RCRA metals by method 6010B/7470A, VOCS by method 8260B, and semi-volatile organic compounds SVOCs by method 8270D. Concentrations of barium, benzene, 1,1-dichloroethane, cis-1,2-dichloroethene, 4-isopropyltoluene, and trichloroethene were detected above applicable method detection limits but were below applicable CGWQS. However, toluene was detected in the groundwater sample collected from MW-10 at 1,600  $\mu$ g/L, which is above the referenced CGWQS range of 560 to 1,000  $\mu$ g/L. Toluene was not detected in the other groundwater monitoring wells. Due to the anomalous nature of MW-10 sample result, the well was redeveloped on January 31, 2023, and resampled on February 2, 2023. Toluene was not detected above the referenced CGWQS in MW-10 during the February sampling event. A summary of recent and historically reported groundwater analytical results can be found in Table 2.

Samples were handled and processed at all times by personnel wearing disposable nitrile gloves. Sampling equipment was cleaned prior to project commencement and before beginning each

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sampling location. Non-dedicated drilling and sampling equipment was cleaned using an Alconox® detergent wash and potable water rinse prior to commencement of the project and between the collection of each sample.

#### 4.9.6 Shallow Exploratory Excavations

Terracon mobilized to the site with E.T Technologies, Inc. on March 10, 2023, to conduct shallow exploratory test pit excavations. The locations of test pits (TP-01 through TP-05) are shown on Exhibit 7. The locations of the test pits were selected to investigate the groundwater anomalies identified in MW-10 (TP-01 and TP-02) and investigate the northwestern and southeastern GPR anomalies identified during Terracon's 2022 geophysical survey (TP-03 through TP-05).

The test pits were excavated to depths approximately 9 to 10 feet below ground surface (bgs), were 2 feet wide, and 10 feet long. The test pits were performed with oversight from a Terracon engineer and a CABI. The excavations were monitored for landfill gases (i.e., methane and hydrogen sulfide) and VOCs with a multi-gas meter. The soils were evaluated in the field for type, color, grain size, suspect ACM, and other soil characteristics, including indications of a landfill cap, fill material, or landfill debris. The excavation depths were terminated after removing at least 5 feet of landfill debris.

TP-01 and TP-02 were found to be similar with 3 feet of clayey well graded sand fill overlaying landfill debris including glass, cobble, wood, plastic, newspaper, cardboard, metal, concrete, rubber, burlap, small paint cans, and motor oil bottles (<1 liter).

TP-03 consisted of 2 feet of clayey brown well graded sand fill overlaying cans, rubber, plastic, newspaper, glass, wood, tires, burlap, cloth, metal, including a car muffler, garbage cans, and containers (<1 liter). Additionally, the landfill debris was more industrial than TP-01 and TP-02.

TP-04 also consisted of 2 feet of clayey brown well graded sand fill overlaying tires, bed spring, metal, newspaper, small paint cans, glass, bottles, wood, rubber, and household waste.

TP-05 was excavated deeper to further characterize the landfill debris in the northwestern corner of the site. It consisted of 3 feet of brown fill which continued from 3 to 9.5 feet along with plastic, metal, springs, wood, rubber, tires, burlap, cloth, cans, and bottles. The pit consisted of less landfill debris than TP-01 through TP-04.

Suspect ACM was not identified during the excavation activities completed at the site on March 10, 2023. The presence of buried drums or tanks or other unexpected conditions was also not observed during excavation activities.



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#### 4.10 Conceptual Site Model

Based on historical information obtained from the previous environmental assessments conducted at the site, the site consisted of open land that was disturbed in the late 1930s and utilized as an unpermitted solid waste landfill until the late 1960s or early 1970s, after which the site has remained vacant land. By 1983, the site appeared similar to its current configuration. The site currently exists as vegetated vacant land.

Previous Phase I ESAs conducted at the site identified the following REC:

Historical use of the site as a landfill and the documented impact to groundwater and soil gas at the site.

Historical investigations have contributed the following information regarding site conditions:

- Previous subsurface assessments identified the general lithology to consist of shallow silty sands and silts overlying landfill materials as deep as 17 feet below ground surface (bgs). Below the landfill materials, silts, sands, and gravels were encountered. Claystone is encountered at 26 to 28.5 feet below ground surface and extends to at least 35 feet bgs, which corresponds to the deepest point of investigation.
- Groundwater was encountered at the site at depths ranging from approximately 6 to 18 feet bgs. The regional groundwater flow direction was identified to the northeast.
- COCs identified at the site during subsurface assessments include sporadic low concentrations of arsenic and asbestos within landfill materials and soils, limited benzene, arsenic, selenium, and toluene in groundwater, and VOCs and methane in onsite soil vapor.
- Arsenic was reported above USEPA Residential and Industrial RSLs and the Colorado background concentration in soil samples collected during the 2007 LSI and 2022 additional assessment activities.
- Benzene was detected above the human health-based Colorado Groundwater Quality Standard (CGWQS) in one groundwater sample collected at the site during the 2007 LSI, however; the groundwater sample collected during the 2021 LSI from approximately the same location did not have a reported benzene concentration above laboratory reporting limits.





- Toluene was detected at 1,600 ug/L at MW-10 in the 2022 sampling, which is above CGWQS of 560 to 1,000 ug/L. MW-10 was redeveloped and resampled in 2023 and toluene was reported at 18 ug/L. Toluene was not detected in the other wells.
- Dissolved Resource Conservation and Recovery Act (RCRA) metals arsenic and selenium were also reported above CGWQS during the 2007 LSI. Selenium was reported slightly above the 50 µg/L CGWQS in two of ten groundwater samples, and arsenic was reported above the 10 µg/L CGWQS in one of ten groundwaters samples during the 2007 LSI. A use restriction is planned for site groundwater to prevent future exposure to COCs.
- Surface water and surface soil samples were collected from Ralston Creek in 2022. Reported concentrations of RCRA Metals and SVOCs in soil, and dissolved RCRA Metals in surface water were at levels below applicable regulatory values and/or at levels not considered a concern to human health or the environment.
- During the 2017 LSI, a number of VOCs were detected across the site in the soil gas samples. The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for residential/industrial/commercial property use: benzene, chloroform, 1,4-dichlorobenzene, ethylbenzene, naphthalene, trichloroethylene, and vinyl chloride. In addition, carbon tetrachloride, dichlorodifluoromethane, and tetrachloroethylene concentrations represented a vapor intrusion concern for residential but not commercial/industrial use.

Methane was evaluated against its Lower Explosive Limit (LEL), which is 50,000 parts per million by volume (ppmv). Laboratory methane detections ranged from 1,790 ppmv to 10,900 ppmv. Methane concentrations exceeded 10% of the LEL, or 5,000 ppmv, for methane at SVP-01, SVP-03, SVP-05, and SVP-07. The 2017 reported methane concentrations indicated a potential ignition risk during onsite subsurface construction activities or if enclosed, onsite structures will be constructed. At this time, only one on-site structure (office building) will be constructed on the far eastern portion of the site. The soil vapor investigation conducted along the site perimeter (southern and eastern) in October 2022, and laboratory methane detections were below 10% of the LEL. In addition, the northern, western, and southern property boundaries are constrained by Ralston Creek and the Croke Canal. The creek and canal likely provide a divide along the site boundaries, and saturated soil along with the low LEL % detections makes offsite vapor migration less likely.

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#### 5.0 APPLICABLE STANDARDS/RISK DETERMINATION

The following standards were used for risk determination at the site:

- The EPA RSLs for soil (May 2023: Target Cancer Risk (TR) of 1E-6, Hazard Quotient (HQ) or 1.0), and further evaluated using exposure-route specific screening levels for industrial land use;
- The EPA Risk-Based SSLs for soil (May 2023);
- The Colorado background concentration for arsenic, per the CDPHE Arsenic Concentrations in Soil Risk Management Guidance for Evaluating (Reviewed/ Revised July 2014);
- The CDPHE WQCD Regulation No. 38 (5CCR 1002-38), Classification 7 Numeric Standards for South Platte River Basin, Laramie Basin, Republic Rover Basin, Smoke Hill River Basin and Regulation No. 31 (5CCR 1002-31), The Basic Standards & Methodologies for Surface Water;
- The CDPHE Water Quality Control Commission published Basic Standards for Groundwater, for groundwater standards (June 30, 2020), referred to as CGWQS in this document; and,
- The 2016 Colorado Department of Public Health and Environment (CDPHE) Indoor Air Screening Concentrations (ASC) – Residential and Worker Remediation Goals, and the June 2017 US EPA Residential and Industrial Indoor Air RSLs, after applying a 3% attenuation factor for sub-slab soil gas per the US EPA Office of Solid Waste and Emergency Response (OSWER) Technical Guide for Assessing and Mitigating the Gas Intrusion Pathway from Subsurface Gas Sources to Indoor Air (OSWER Guidance, June 2015) and VISL (EPA, 1E-06 target cancer risk, 1 target non-carcinogen hazard quotient, VISL Calculator V. 3.5.1, May 2022)

After implementation of the remediation plan described below, potential risks to human health or environment on-site will be considered low. The general risk factors are discussed in more detail in the following sections.

#### 6.0 EXPOSURE PATHWAYS AND MITIGATION

The following exposure pathways are considered to be complete or potentially complete during redevelopment at the site (refer to Tables 1-5 for a comparison of soil, groundwater, and soil gas concentrations to exposure-specific screening levels for industrial land use):



- Industrial Soil Dermal Contact (Soil I-Derm);
- Industrial Soil Ingestion (Soil I-Ing); and;
- Industrial Vapor Intrusion (Soil Gas vi).

As noted in the site investigation summaries, soil impacts exceeding Colorado background levels were limited to arsenic in soil borings B3 and B4 advanced as part of Terracon's 2007 LSI.

Several metal and VOC detections, and/or detection limits for these COCs, were above their respective Risk-Based SSLs. However, COCs did not exceed CGWQS in the samples collected from monitoring wells installed in 2023, with the exception of toluene the first time MW-10 was sampled. Toluene did not exceed CGWQS after it was redeveloped and resampled in February 2023. As a result, it does not appear that the Risk-Based SSLs exceedances are impacting groundwater at this time.

The industrial soil exposure routes were further evaluated using US EPA exposure-route specific screening levels (ingestion, dermal contact, and inhalation). Results are shown in Table 3. The maximum arsenic concentration that exceeded the generic Industrial RSL and Colorado background levels also exceeded the Soil Ingestion Screening Level and Soil Dermal Contact Screening Level. The Soil Inhalation Screening Level was not exceeded. Vapor intrusion exposure routes were evaluated using US EPA industrial/worker screening levels. The concentrations of multiple VOCs exceeded the US EPA Industrial RSL. Results are shown in Table 5.

EXPOSURE PATHWAY	SOIL	GROUND WATER	SURFACE WATER	SEDIMENT	BUILDING MATERIALS
<b>Soil</b> – Dermal Contact (Soil <sub>Derm</sub> )	C*		NA		NA
<b>Soil</b> – Ingestion (Soil <sub>Ing</sub> )	C*			NA	
<b>Soil</b> – Vapor Inhalation (Soil <sub>Inh</sub> )	NC	NA			
<b>Soil</b> – Leach to Groundwater (Soil <sub>GW</sub> )	NC				
<b>Soil Gas</b> – Vapor Intrusion (Soil Gas <sub>VI</sub> )	C*				
Groundwater – Ingestion (GW <sub>Ing</sub> )		NC			
<b>Groundwater</b> – Vapor Inhalation (GW <sub>Inh</sub> )	NA	NC			



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EXPOSURE PATHWAY	SOIL	GROUND WATER	SURFACE WATER	SEDIMENT	BUILDING MATERIALS
<b>Groundwater</b> – Migration to Surface Water (GW <sub>SW</sub> )		NC			
Surface Water – Dermal Contact (SW <sub>Derm</sub> )			NC	-	
Surface Water – Ingestion (SWIng)		NA	NC		
Sediment – Dermal Contact (Sed <sub>Derm</sub> )					
Sediment – Ingestion (Seding)			INA		

NA – Exposure pathway not applicable to the media NC – Not anticipated to be complete C – Exposure pathway complete \* For industrial/worker exposures

The following table summarizes the environmentally-impacted media on- and off-site, based on Terracon's assessment activities and results.

ENVIRONMENTAL	ON-SITE			OFF-SITE			TYPES OF
MEDIA	Yes	No	Not Sampled	Yes	No	Not Sampled	IMPACTS
Soil	Х					Х	Arsenic
Groundwater		Х				Х	
Soil Vapor	Х					Х	VOCs & Methane
Surface Water		Х			Х		
Sediment			NA			NA	
<b>Building Materials</b>			NA			NA	

#### NA – Exposure pathway not applicable to the media

#### 6.1 Soil Pathways

As noted in Section 6.0, the Industrial RSL/Colorado background concentration for arsenic were exceeded, and soil exposure routes related to construction workers or commercial land use are considered complete.

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Arvada, Colorado July 18, 2023 
Terracon Project No. 25227359



Industrial/Worker RSL soil exposure pathways are considered complete during construction. The soil vapor inhalation pathway is not considered complete at the site as COCs were not detected above the industrial/worker soil inhalation screening level in the soil samples collected from the site. The soil contaminant leaching to the groundwater pathway is not considered to be complete based on the groundwater analytical results for samples collected from the constructed monitoring wells.

Based on the proposed construction, engineering controls, and Environmental Use Restriction (Section 7.5), the Soil<sub>I-Derm</sub>, Soil<sub>I-Ing</sub>, and Soil<sub>GW</sub> pathways are not anticipated to be complete after redevelopment. The proposed construction will consist of an RV storage parking lot, a stormwater detention basin, and a storage office building. The majority of the site will not require excavation to facilitate construction, with the exception of the stormwater detention basin area, installation of light poles, and a small amount of underground utility installation. The developer intends to excavate impacted soil/landfill material for off-site disposal where it is encountered during development. The majority of the remainder of the property will be streetscaped and landscaped areas, with packed gravel or compacted asphalt millings as surfacing materials in drive and parking areas. The proposed construction is expected to mitigate the completion of the Soil<sub>I-Derm</sub> and Soil<sub>I-Ing</sub> pathways following excavation activities and reduce groundwater infiltration into onsite landfill materials. The methods to characterize, manage, and dispose of impacted soil are described in more detail in Section 7.1 and in the MMP, which is included as Appendix F.

#### 6.2 Soil Gas Pathways

The soil gas vapor intrusion pathway is considered complete at the site based on soil gas sampling results indicating the presence of multiple VOCs above VISLs and methane above 10% of the LEL in site soil gas.

#### 6.3 Groundwater Pathways

The groundwater ingestion and groundwater vapor intrusion pathways are not considered complete at the site based on the groundwater samples collected from the constructed monitoring wells. In addition, the site office building will be serviced by a municipal water supply and no dewatering activities are anticipated during construction.

Fifty seven existing water wells (not abandoned) registered with the Colorado Division of Water Resources were identified within 2,640 feet (0.5 miles) of the site and are depicted on Exhibit 9 and listed on Table 6. Several domestic/household wells were identified within 2,640 feet of the site; however, groundwater impacts were not identified in the recent samples collected from the constructed monitoring wells.



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#### 6.4 Surface Water Pathways

The surface water exposure pathways are currently considering incomplete, based on the 2022 surface water sampling results from Ralston Creek. However, based on historical erosion during flood events that has resulted in landfill debris being exposed, and the currently impaired streambank along the property, continued erosion poses a risk of additional waste exposure to Ralston Creek. The City of Arvada in coordination with the Mile High Flood District (MHFD) has required mitigation of this risk in order to facilitate development of the site (Section 7.4) The client is working with MHFD to develop the bank stabilization/armoring design to be implemented during redevelopment.

#### 7.0 REMEDIAL ACTION PLAN

The proposed RAP for the site considers no new changes to the current planned development of the site and includes specific remedial tasks that will be implemented to mitigate and reduce short-term and long-term exposures to site contaminants. The conceptual RAP selected for this site is summarized below.

#### 7.1 Excavation and Disposal of Landfill Material and Impacted Soil

Excavation activities during redevelopment will be conducted to facilitate construction of the RV storage parking lot, stormwater detention basin, installation of light poles, a small amount of underground utility installation, and the storage office building. Based on Terracon's July 2007 LSI results, arsenic concentrations exceeded EPA Industrial RSLs and the Colorado background standard in two soil samples collected from across the site, so arsenic will be considered a COC based on historical knowledge of the landfill material. Based on professional experience, it is expected that other RCRA metals, VOCs, and semi-volatile organic compounds (SVOCs) may be encountered in the landfill material. It is anticipated that landfill material excavated and generated to facilitate development will be sampled, characterized and disposed of as a special waste at a Subtitle D Landfill per the Materials Management Plan (MMP) based on a waste characterization profile created from analytical data for the site.

#### 7.2 Lining of Stormwater Detention Basin

In the stormwater detention basin area, Terracon's November 2021 LSI identified landfill materials beginning at 1.5 to 3 feet bgs, and extending to approximately 6 feet deep, with a maximum depth of 9 feet bgs. Based on the designed depth of the stormwater detention basin, landfill materials will likely be exposed and need to be removed to facilitate construction. Landfill material generated during construction of the stormwater detention basin will be handled and managed in accordance with the MMP. The stormwater detention basin area will require approximately 2-3 feet of over-excavation of the bottom and sidewalls to allow adequate placement of clean fill and/or clay type material over the landfill material to prevent direct exposure of landfill waste.

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Liner material will be placed over the clean fill material to prevent stormwater from infiltrating into the landfill materials. The stormwater detention pond and liner system will be designed by the project civil engineer, Harris Kocher Smith (HKS), in accordance with applicable solid waste standards.

In the event ACM is encountered during redevelopment activities, it shall be managed in accordance with the MMP and in compliance with CDPHE Air Regulation No. 8 and Title 6 of the Colorado Code of Regulations, Paragraph 1007-2, Part 1 - Regulations Pertaining to Solid Waste Sites and Facilities., Section 5.5 Management of Regulated Asbestos-Contaminated Soil.

#### 7.3 Vapor Mitigation System Installation

As noted in Section 6.2, the office building will require an active VMS to mitigate the soil gas vapor intrusion exposure pathway. The VMS will be designed by a professional engineer and contain LEL and pressure sensors and be tied to a fire control panel in the event that vapors exceed 5 and 10 percent trigger levels to address soil gas vapor instruction. The installation of the vapor mitigation system will be observed and tested under the supervision of a professional engineer licensed in Colorado to document that the membrane and other system infrastructure has been installed per the manufacturer's and design specifications. The VMS will be tested and certified by the professional engineer to ensure proper operation prior to building occupancy.

#### 7.4 Ralston Creek Streambank Stabilization

Erosion along the south bank of Ralston Creek within the property boundary has the potential to result in landfill debris being exposed and impacting the surface waters of the stream segment. In order to mitigate this exposure pathway, streambank stabilization will be conducted on segments of the streambank within the property that are determined to be impaired. The streambank stabilization efforts may include removal of some existing vegetation, regrading of the streambank elevations, placement of appropriate geotextile or natural fiber erosion control systems, and planting of native plants suitable to revegetate the disturbed areas. The streambank stabilization plan will be designed by Terracon based on observed streambank conditions at the time of development, with input from the Mile High Flood District. The appropriate state and/or federal permits will be acquired prior to initiation of streambank stabilization work.

#### 7.5 Notice of Environmental Use Restriction and NAD Request

The proposed remedial actions identified are considered to be protective of human health and the environment as exposure to landfill materials, arsenic in soils, and VOCs and methane in soil gas will be mitigated either through the removal of landfill materials or through engineered controls. However, impacted landfill material will be left in place at concentrations that exceed EPA Industrial/Worker RSLs and vapor intrusion screening levels that predict indoor air quality exceedances. Following the completion of the RAP, a request for a No Action Determination

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(NAD) will be prepared and submitted to CDPHE. The NAD request will include a proposed Notice of Environmental Use Restriction. The proposed Use Restriction would include language that generally describes the following:

- Restriction to the disturbance of soils and landfill material in areas where landfill materials and/or arsenic-impacted soil exceedances exist, with reference to the MMP and CDPHE notification;
- Although groundwater impacts were not identified in the latest groundwater samples collected from the constructed monitoring wells, restriction of onsite groundwater use will be included based on the history of the site;
- Placement of an active VMS beneath building footprints, with reference to VMS OM&M Plan; and,
- Periodic inspection of the stream bank and maintenance as required.

EXHIBITS













TP-03				The second second	
			TP-02		- D HERE
bing			TP-01	rportation © 2023 TomTom (9 Vex	250 feet
AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS	Project Manager: Project No. 25227359		TEST PIT LOC	ATIONS	Exhibit
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES	Drawn by:         JDA         Scale: AS SHOWN           Checked by:         KRS         File Name: Exhibit 7           Approved by:         Date:         07.17.2023	10625 W I70 Frontage Rd N Ste 3 Wheat Ridge, CO 80033-1729	Former Kilmer Landfi 6800 Kilmer S Arvada, Colo	II Development Street rado	7

	Public Access Easement to be Dedicated Ralston Creek Trail	25 Outdoor Storage Setback	20° Buffer	Flood Plain		Detention (36,158 SF)
SITE DATA			30 - 30			30-
Zoning:	IL (Industrial, Light)					
Total Site Area:	14.0 AC	21' Access Easement		30-20-		
Maximum RV Storage Area:	4.90 AC, 213,444 SF, (35%)					23
Proposed RV Storage Area:	6.24 AC, 272,128 SF, (44.57%)					
DV/ Stalls	(With Minor Modification)	81 1.1.				
Total RV Stalls	356 Stalls					
RV Stalls (12'x30' min):	119 🐵					
RV Stalls (12'x25' min):	94 💌		X OO X			
RV Stalls (12'x20' min):	143 🛆	OS.	240'			
Storage Buildings			HI	30		
Storage Office:	120 SF, (0.04%)	V`		$\sim$	30'	
<u>Driveway</u>		NALESSEN 1		$\sim$		
Drive Aisle Width:	30'			240'	240'	
<u>Duiluiliy</u> East Setback:	20'				$\sim$ $\sim$ $\sim$	
North Setback:	20'			- C		240'
South Setback:	240' (Minor Modification)					707
RV Storage	· · · ·				THE.	$\overline{()}$
Setback from RN Zone:	240' (Minor Modification)	DN 4			-/-	
Landscape Bufferyard:	Type C= Minimum 20'	KIN-4 2	LOINING			
East:	20'				+	
North:	20'					-
South:	138'- 275'		. Si			+

6800 KILMER CONCEPT SITE PLAN- RV STORAGE WITH NO MAJOR MODIFICATION REQUESTS JUNE 1, 2023

## Exhibit 8 Site Development Plan





NORRIS-DESIGN.COM 1101 BANNOCK STREET DENVER, CO 80204 P 303.892.1166



#### COLORADO'S Decision Support Systems

## Exhibit 9 Location of Regional Groundwater Wells



2,339 0 1,169 2,339 Feet 1: 14,032

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

TABLES

## Table 1 Summary of Detected Analytes in Soil Former Kilmer Landfill - Proposed Storage Development 6800 Kilmer Street, Arvada, Colorado Terracon Project No. 25227359

Ormania ID and Danith				B-3	B-4	B-6	B-9	SS-01	SS-02	SS-03	SS-04
Sample ID and Depth				COMP	COMP	COMP	COMP	COMP	COMP	COMP	COMP
Collection Date				5/25/07	5/25/07	5/25/07	5/25/07	10/10/22	10/10/22	10/10/22	10/10/22
Devenuetor	Residential	Industrial	Risk-Based	malka	ma ar /l c ar	m a ll ca	ma ar /l car	ma au // s au			me er /le er
Parameter	RSL	RSL	SSL	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
RCRA Metals (6020B / 7471)											
Arsenic <sup>1</sup>	0.68	3.0	0.0015	15	26	4.6	1.2	4.23	8.93	6.3	7.21
Barium	15,000	220,000	160	180	200	98	120	101	98	62.8	132
Cadmium	71	980	0.69	1.1	0.64	1.5	0.28	1.24	0.972	1.17	2.25
Chromium	NE	NE	NE	30	16	14	22	15	22.3	11.7	25.8
Lead	400	800	NE	160	31	71	14	53.9	66.8	53.1	94.4
Mercury	11	46	0.033	0.087	0.14	6.4	0.047	0.0527	0.209	0.11	0.136
Selenium	390	5,800	0.52	5.5	4.5	5.0	3.0	<2.0	<2.0	<2.0	<2.0
VOC (8260B) - Not detected											
SVOCs (8270D) - Not detected											
Benzo(b)fluoranthene	1.1	21	0.3000	NA	NA	NA	NA	0.00767	< 0.00600	< 0.00600	< 0.00600
Fluoranthene	2,400	30,000	89	NA	NA	NA	NA	0.00831	< 0.00600	< 0.00600	0.00691
Pyrene	1,800	23,000	13	NA	NA	NA	NA	0.00686	<0.00600	<0.00600	0.00663
PCBs (8082) - Not detected	CBs (8082) - Not detected										

RSL = US Environmental Protection Agecy (EPA) Regional Screening Level (May 2023)

SSL = US EPA Soil Screening Level (May 2023)

mg/kg = milligram per kilogram

Only detected analytes shown (detected concentrations are **bold**)

Shading = Indicates an exceedance of the regulatory value with the corresponding color

NE = Not Established

RCRA = Resource Conservation and Recovery Act

<sup>1</sup> The CDPHE Background concentration is 11 mg/kg, per the Risk Management Guidance for Evaluating Arsenic Concentrations in Soil, reviewed/revised July 2014.

VOC = Volatile Organic Compounds

SVOC = Semivolatile Organic Compounds

PCB = Polychlorinated Biphenyl

NA = Not Analyzed

#### Table 2 Summary of Detected Analytes in Groundwater Former Kilmer Landfill - Proposed Storage Development 6800 Kilmer Street, Arvada, Colorado Terracon Project No. 25227359

Sample ID		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	SB-11	SB-11	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10
Collection Date		5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	11/3/21	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22	2/2/23
Parameter	CDPHE Reg. 41 Groundwater Standard <sup>1</sup>	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	μg/L									
										Disso	olved RCRA N	letals												
											(6010B/7470A	.)												
Arsenic	10 <sup>M</sup>	<20	<20	<20	<20	<20	24	<20	<20	<20	<20	NA	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	NA
Barium	2,000 <sup>M</sup>	290	90	430	1,100	420	360	330	280	480	99	NA	69	84	91	59	81	86	81	240	67	71	86	NA
Selenium	50 <sup>M</sup>	<20	<20	68	<20	<20	67	<20	<20	<20	<20	NA	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	NA
	VOCs (8260B)																							
Benzene	5 <sup>™</sup>	<1.0	<1.0	6.8	<1.0	<1.0	<1.0	<1.0	1.8	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.7	<1.0	<1.0	<10	<1.0
1,4-Dichlorobenzene	75 <sup>™</sup>	<1.0	<1.0	7.9	5.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0
1,1-Dichloroethane	NE	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	<1.0	<1.0	<1.0	6.2	2.6	<1.0	<1.0	2.1	<1.0	<1.0	<10	<1.0
cis-1,2-Dichloroethene	14 to 70 <sup>M</sup>	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	<1.0	<1.0	<1.0	5.4	7.4	2.1	<1.0	1.5	2.3	<1.0	<10	<1.0
4-Isopropyltoluene	NE	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<10	<1.0
Naphthalene	140	<5.0	<5.0	15	<5.0	<5.0	<5.0	<5.0	12	<5.0	<5.0	NA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<2.0
Toluene	560 to 1,000 <sup>M</sup>	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,600	18
Trichloroethene	5 <sup>™</sup>	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0
Xylenes, Total	1,400 to 10,000 <sup>M</sup>	<3.0	<3.0	3.8	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0
	SVOCs (8270D SIM)																							
Naphthalene	140	NA	NA	<0.50	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50	0.98	<0.50	<0.50	<0.50	< 0.50									
	PCBs (8082) - Not Analyzed (2007-2021) Not Detected (2022)																							

CDPHE = Colorado Department of Public Health and Environment

Reg. 41 = Water Quality Control Commission Regulation No. 41 - The Basic Standards for Ground Water (June 30, 2020)

<sup>1</sup> Colorado Department of Public Health and Environment Basic Standards for Ground Water (Regulation 41, Table A,

Table 1, and Table 2 June 30, 2020) <sup>2</sup> The first number for lead is the US Environmental Protection Agency (EPA) treatment technique and the second number is the Reg. 41 Domestic Water Supply Human Health Standard Note: When a range of standards is listed, the first number in the range is a human health-based value and the second number in the range is a Maximum Contaminant Level (MCL).

<sup>M</sup> Drinking water MCL

<sup>m</sup> Drinking water MCL μg/L = micrograms per liter RCRA = Resource Conservation and Recovery Act Only detected analytes shown (detected concentrations are **bold**) NE = Not Established VOC = Volatile Organic Compounds SVOC = Semivolatile Organic Compounds DOD = Detucherized Disheard

PCB = Polychlorinated Biphenyl

NA = Not Analyzed

# Table 3Industrial Exposure Route Evaluation – SoilFormer Kilmer Landfill - Proposed Storage Development6800 Kilmer Street, Arvada, ColoradoTerracon Project No. 25227359

		Sampla II	B-3	B-4	B-6	B-9	
		Sample II	COMP	COMP	COMP	COMP	
		Col	5/25/07	5/25/07	5/25/07	5/25/07	
Landuse:	Industrial	/Composi	te Worker				
Parameter/Exposure-	Ingestion	ngestion Dermal		mg/kg	mg/kg	mg/kg	mg/kg
Route Specific SL <sup>1</sup> :	SL	SL	SL				
Arsenic	3.6	17	3,900	15	26	4.6	1.20

1) US EPA Screening Level, 1E-06 carinogenic risk, 1 Target Hazard Quotient (May 2021) mg/kg = milligram per kilogram

#### Table 4 Summary of Detected Analytes in Surface Water Former Kilmer Landfill - Proposed Storage Development 6800 Kilmer Street, Arvada, Colorado Terracon Project No. 25227359

						R	alston Creek -	Stream Segme	ent 18a					
	Ann	DMD	Inf		Po	tential Dischar	ge Permit Limit	GW Std	SW-01	SW-02	SW-03			
Analytes	Fraction	App	List	Liet	Chronic	Chronic Acute Obrania TVS Acute TVS Fish DW/S		DWS	(Reg 41 <sup>3</sup> )					
		LISU		LISU	Numeric	Numeric		Indict (VS)         Acute (VS)         Ingestion         DWS           (Reg 31 <sup>2</sup> ,38 <sup>1</sup> )         (Reg 31 <sup>2</sup> )         (Reg 31 <sup>2</sup> )         (Reg 31 <sup>2</sup> )	(Deg 212)	(µq/L)	10/10/22	10/10/22	10/10/22	
					(Reg 38 <sup>1</sup> ) (Reg	(Reg 381)	(Reg 512,367)		(Reg 31 <sup>2</sup> )	(Reg 31-)		μg/L	μg/L	µg/L
Dissolved RCRA	Metals (6010B/7470/	A)												
Arsenic	Dissolved	Ν	Ν	Ν	-	340	-	-	7.6	0.02-10	10	<10	<10	<10
Barium	Dissolved	N	Ν	Ν	-	-	-	-	-	490 / 1,000	2,000	45.4	45.0	45.6
Cadmium	Dissolved	N	Ν	Ν	-	-	0.72	5.01	-	5	5	<2.0	<2.0	<2.0
Chromium III	Dissolved	Ν	Ν	Ν	-	-	130.75	1,005	-	50	100	<10.0	<10.0	<10.0
Lead	Dissolved	N	Ν	Ν	-	-	5.31	136.14	-	50	50	<6.0	<6.0	<6.0
Mercury	Total Recoverable	N	Ν	Ν	0.01	-	-	-	-	2	-	<0.200	<0.200	<0.200
Selenium	Dissolved	N	Ν	Ν	-	-	4.6	18.4	4,200	50	50	<10	<10	<10
Silver	Dissolved	Ν	Ν	Ν	-	-	1.05	6.69	-	100	50	<5.0	<5.0	<5.0
VOCs (8260B)	VOCs (8260B) and PAHs (8270C)													ND

< - data flag indicates a non-dectect reported by the laboratory at the indicated numeric concentration

µg/L - micrograms per liter

<sup>1</sup> Reg 38 - Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) Regulation No. 38 (5CCR 1002-38), Classification 7 Numeric Standards for South Platte River Basin, Laramie Basin, Republic Rover Basin, Smoke Hill River Basin

<sup>2</sup> Reg 31 - CDPHE WQCD Regulation No. 31 (5CCR 1002-31), The Basic Standards & Methodologies for Surface Water

<sup>3</sup> Reg 41 - CDPHE WQCD Regulation No. 41 (5CCR 1002-41), The Basic Standards for Ground Water

DWS - Domestic Water Supply

RCRA = Resource Conservation and Recovery Act

VOC - Volatile Organic Compounds

NA - standard is not applicable to the stream segment based on the stream classification

#### NOTES

Mainstem of Ralston Creek, including all tributaries and wetlands, from the outlet of Arvada Reservoir to the confluence with Clear Creek.

Table Value Standard (TVS) values calcuated based on assumed hardness of 200 milligrams per liter (mg/L)

### Table 5 Summary of Soil Vapor Industrial Exceedances Former Kilmer Landfill - Proposed Storage Development 6800 Kilmer Street, Arvada, Colorado Terracon Project No. 25227359

Sample ID					SVP-01	SVP-02	SVP-03	SVP-04	SVP-05	SVP-06	SVP-07	SVP-08	SVP-09	SVP-10	SVP-11	SVP-12	SVP-13	SVP-14	SVP-15	SVP-16	SVP-17	SVP-18	SVP-19	SVP-20	SVP-21	SVP-22	Maximum Reported Conc.	Calculated Indoor Air Conc. <sup>1</sup>
Collection Date					08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	08/31/2017	08/31/2017
Parameter		USEPA Industrial RSL	CDPHE Worker ASC	Commercial VISL	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
VOC (TO-15)																												
Benzene		1.6	1.6	52.4	78.6	11	249	7.3	2.79	13	10.4	12	3.86	9.49	11.2	<51.1	114	5.76	NA	249	7.47							
Chloroform		0.53	0.53	17.8	<77.9	73.2	<38.9	36.3	90.7	29	49.1	60.7	1.04	149	12.7	<77.9	<77.9	10.3	NA	149	4.47							
1,4-Dichlorobenzene		1.1	1.1	37.2	<96.2	<1.2	49.6	<1.2	<1.2	1.78	2.95	<9.62	<1.2	4.52	1.77	<96.2	<96.2	2.62	NA	49.6	1.49							
Ethylbenzene		4.9	4.9	164	2,110	9.22	1300	1.99	1.26	1.95	4.16	<6.94	3.11	8.54	3.62	87.9	167	32	NA	2,110	63.3							
Naphthalene		0.36	NE	12.0	<264	<3.3	<132	4	<3.3	5.69	13	<26.4	<3.3	<3.3	7.3	<264	<264	4.54	NA	13	0.390							
Trichloroethylene		3	3	99.7	418	1.55	175	7.72	<1.07	2.39	2.06	<8.57	<1.07	65.9	1.45	123	148	4.61	NA	418	12.5							
Vinyl chloride		2.8	2.8	92.9	289	<0.511	68.4	<0.511	<0.511	< 0.511	< 0.511	<4.09	<0.511	<0.511	< 0.511	<40.9	196	<0.511	NA	289	8.67							
Methane (8015M)	10% LEL	25% LEL	LEL							1		1								1	1							
Methane (parts per million by vol)	<u>5,000</u>	12,500	50,000		10,900	NA	<u>8,090</u>	NA	<u>7,870</u>	NA	<u>5,540</u>	NA	NA	1,790	NA	NA	4,980	NA	<4,000	<4,000	<4,000	NA	<4,000	<4,000	<4,000	<4,000		
NOTES:																												

1) As calculated using a 3% attenuation factor per the Office of Solid Waste and Emergency Response Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (June 2015) and the maximum reported concentration

1) As Calculated using a 3% attendation factor per the Office of Solid Waste and Emergency Response Technical Guide for Assessing and Mitigating the RSL = United States Environmental Protection Agency (USEPA) Indoor Air Regional Screening Level (June 2017), μg/m<sup>3</sup> ASC = Colorado Department of Public Health and Environment (CDPHE) Air Screening Concentrations, Remediation Goals (January 2016), μg/m<sup>3</sup> VISL - Vapor Intrusion Screening Level (EPA, 1E-06 target cancer risk, 1 target non-carcinogen hazard quotient, VISL Calculator V. 3.5.1, May 2022) NE = Not Established NA = Not Applicable

NA = Not Applicable < = Less than the laboratory reported detection limit LEL = Lower Explosive Limit Only detected analytes shown (detected concentrations are **bold**) Calculated Indoor Air Concentration exceeds Residential RSL or ASC Calculated Indoor Air Concentration exceeds Industrial RSL or Worker ASC Methane concentration exceeds 10% of the LEL Methane concentration exceeds 25% of the LEL Methane concentration exceeds the LEL

#### Table 6 List of Regional Groundwater Wells Former Kilmer Landfill - Proposed Storage Development 6800 Kilmer Street, Arvada, Colorado Terracon Project No. 25227359

Receipt	Permit	Latitude	Longitude	Contact Name	Well Type
17253	17253-MH	39.815947	-105.169853	JEFFERSON CNTY SCHOOLS	Monitoring/Sampling
17739	17739-MH	39.815947	-105.169853	JEFFCO SCHOOLS	Monitoring/Sampling
23099	23099-MH	39.814164	-105.172209	FARMERS HIGH LINE CANAL & RESERVOIR	Monitoring/Sampling
24121	94350-VE	39.826347	-105.170818	SCHNELL TOM & DEBBIE	Domestic
0028318H	28318-MH	39.821414	-105.172187	CO DEPT MILITARY AFFAIRS	Monitoring/Sampling
0033595A	211509-	39.820858	-105.172078	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595B	211510-	39.820309	-105.171902	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595C	211511-	39.820652	-105.17119	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595D	211512-	39.82058	-105.17119	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595E	211513-	39.820175	-105.171376	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595F	211514-	39.82086	-105.171015	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595G	211515-	39.82031	-105.171376	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595H	211516-	39.82003	-105.171375	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
52796	52796-DW	39.821356	-105.167486	VALLES, CONSTRUCTION	Dewatering
0053997Q	91-GX	39.823285	-105.17018	KLEBL, NORBERT	Other
0053997R	91-GX	39.823366	-105.170133	KLEBL, NORBERT	Other
0053997S	91-GX	39.823114	-105.170179	KLEBL, NORBERT	Other
0053997T	91-GX	39.823068	-105.170378	KLEBL, NORBERT	Other
0053997U	91-GX	39.823194	-105.17039	KLEBL, NORBERT	Other
55233	55233-MH	39.815638	-105.174425	CENTURY COMMUNITIES LLC	Monitoring/Sampling
59646		39.819604	-105.174572	HAYES CONSULTING CO	Monitoring/Sampling
59647	59647-MH	39.819604	-105.174572	HAYES CONSULTING CO	Monitoring/Sampling
61067	61067-MH	39.817058	-105.164743	SPA PROPERTIES LLC	Monitoring/Sampling
62665	62665-MH	39.820346	-105.171423	CARLSON ASSOCIATES INC	Monitoring/Sampling
0077107A	89243A	39.817428	-105.170668	MURRAY EARL & RUTH	Domestic, Stock
0077107B	89243-	39.817419	-105.170668	MURRAY EARL N & RUTH	Domestic
0077107D		39.817789	-105.172198	MURRAY, E R	Domestic, Stock
0077107E	22298-F	39.81894	-105.171735	MURRAY, E R	Domestic, Stock
200888	24660-F-R	39.826468	-105.168446	DONALDSON CRAIG W & SUSAN	Irrigation
0200888A	24660-F	39.826441	-105.168446	SMITH, GERALD R	Domestic, Irrigation
256328	30764A	39.82607	-105.169567	VON MICHAELS CAROL & DAVID M STOCKER	Domestic
349412	168964-	39.817203	-105.163879	REHR JERRY & ROBERTA	Household use only
0373568B	185686A	39.826348	-105.170643	SCHNELL TOM & DEBBIE	Domestic
496223	244360-	39.824955	-105.174098	VOSE, MELINDA J	Domestic
918546	2403-AD	39.82607	-105.169567	WILLIAM R FORBES	Irrigation
3669863	298045-	39.81749	-105.16458	BATES, VONA J	Domestic, Stock
3675445A	303208-	39.815638	-105.174425	CENTURY COMMINITIES	Monitoring/Sampling
3675445B	303209-	39.815873	-105.174157	CENTURY COMMINITIES	Monitoring/Sampling
9025532	5560-	39.825055	-105.172176	SCHERBEL, HENRY	Domestic
9025536	5579-	39.825055	-105.172176	SCHERBEL, JOHN	Domestic
9025915	8042-	39.821359	-105.163276	BEVER, ERNEST	Domestic
9026170	9796-	39.825055	-105.172176	SCHEIBEL, JOHN	Domestic
9026511	12703-F	39.815561	-105.16523	HEIMMER DONALD H & TAYLOR KEVIN J	Irrigation
9027526	21919-	39.826691	-105.169744	DREYER, SHARRON C	Domestic
9027675	23465-F	39.820896	-105.164986	JURY, HOWARD D	Irrigation
9028759	33453-	39.821359	-105.163276	GREER, THEODORE M	Domestic
9029062	36849-	39.825055	-105.172176	FEAR A CURTIS & KIMBERLY A	Domestic
9029392	40965-	39.814164	-105.172209	ASHLEY, FRANCES	Domestic
9029657	44002-	39.82634	-105.169393	VON MICHAELS CAROL & DAVID M	Domestic
9029661	44111-	39.824017	-105.174412	FORBES, DONALD B	Domestic
9029718	44797-	39.821356	-105.167486	GILLIGAN FAMILY LTD PARTNERSHIP	Domestic, Stock
9030978	62568-	39.826685	-105.167886	ARCURI ANTHONY P & NOELLE S	Domestic
9031602	71951-	39.817368	-105.16798	GOLDEN RETRIEVER RESCUE OF THE ROCKIES	Domestic
9031613	72045A	39.823475	-105.16976	WICKHAM CLARK J & DORIS L	Domestic
9033083	89242A	39.816495	-105.173691	KULA, JOHANN	Domestic, Stock
C300750	750-WCB	39.817789	-105.172198	MURRAY, EARL	Domestic
C301824	1824-WCB	39.817734	-105.163278	HERRING, GORDON	Domestic

APPENDIX A LIMITED SITE INVESTIGATION REPORT – TERRACON (On CD) APPENDIX B PRELIMINARY GEOTECHNICAL ENGINEERING REPORT – TERRACON (On CD) APPENDIX C LIMITED SITE INVESTIGATION REPORT - TERRACON (On CD) APPENDIX D PHASE I ENVIRONMENTAL SITE ASSESSMENT – TERRACON (On CD)

## APPENDIX E LIMITED SITE INVESTIGATION REPORT – TERRACON (On CD)

APPENDIX F MATERIALS MANAGEMENT PLAN – TERRACON (On CD) APPENDIX G WETLAND REVIEW – TERRACON (On CD) APPENDIX H HISTORICAL REPORTS PRIOR TO TERRACON INVOLVEMENT (On CD)

APPENDIX I ADDITIONAL SITE ASSESSEMENT (TERRACON 2022-2023) LABORATORY REPORTS (On CD)